

Description

Method and device for monitoring a pulse charging valve of an internal combustion engine

The invention relates to a method and device for monitoring a pulse charging valve of an internal combustion engine, with the pulse charging valve located in an induction pipe.

An internal combustion engine is known from DE 102 00 533 A1. It has a manifold, from which an induction pipe leads to an intake of a cylinder of the internal combustion engine. A gas intake valve is located at the intake of the cylinder. A pulse charging valve is located upstream of the gas intake valve in the induction pipe. The pulse charging valve releases or seals the induction pipe as a function of its selected position. An injection valve is also provided, to meter the fuel.

A system for diagnosing incorrect operation of a check valve in an internal combustion engine is known from EP 521 545 A2. The check valve is located in an induction pipe and prevents a backflow of air and/or fuel from the combustion chamber of the internal combustion engine. The system detects a pressure in an induction tract upstream from the check valve and downstream from a throttle valve. The system indicates incorrect operation of the check valve, when an anomalous fluctuation occurs in the detected pressure. The diagnosis is preferably carried out in a predetermined operating state of the internal combustion engine. This predetermined operating state is the idle state of the internal combustion engine at low charge pressure.

The fast-switching pulse charging valves assigned to each cylinder are closed during the first part of the induction sequence, so that a high negative pressure can build up. After approximately half the induction sequence the pulse charging valve - the fast-switching cross-sectional switch - suddenly opens, such that the negative pressure generated in the cylinder during the first part of the induction sequence causes the air/fuel mixture taken in to flow in at a very high speed. The column of intake air flowing very quickly into the combustion chamber of the cylinder of the internal combustion engine produces significant charging effects in the lower and average speed range of the internal combustion engine due to the improved filling characteristic of the respective combustion chamber.

A defect in the pulse charging valve can result in the air mass actually taken in during an induction stroke of a cylinder being smaller than with a correctly operating pulse